

The Department of Biomedical Engineering

Presents:

**Design of Engineered Environments to Study Tissue Repair and Disease
Mechanisms**

By

Prof. Kristyn Masters

Department of Biomedical Engineering

University of Wisconsin

ABSTRACT:

Traditional tissue engineering techniques focus primarily on the construction of healthy neo-tissues, wherein optimization of the biomaterial system is performed to promote maintenance of a healthy cell phenotype. However, an emerging application of tissue engineering is the recreation or replication of diseased human tissues, which may help to uncover disease mechanisms and etiology, as well as provide advanced, physiologically-relevant *in vitro* platforms for testing disease treatments. To this end, we have developed engineered *in vitro* tissue systems to mimic elements of *in vivo* dysfunction of various tissues, including heart valves, heart muscle, and chronic wounds. For example, our work in creating calcific valvular disease *in vitro* has revealed information about the roles of extracellular matrix components, growth factors, peptide-receptor interactions, and intracellular signaling pathways in valve calcification. This presentation will concentrate on ways to tailor both 2-D and 3-D *in vitro* environments to regulate cell phenotype of these cells and create defined systems that mimic elements of native pathologies, thereby providing insight into the mechanisms of disease progression and potential targets for its prevention.

3:35 – 4:30 P.M.

Monday, November 16, 2009

Room 2-101 NHH

BME 8601 Graduate Seminar

For information, contact Rachel Boehme at bmengp@umn.edu , 612-624-8396.